ABSTRACT

Optical code-division multiplexing and demultiplexing (CDM) using orthogonal codes with minimum shift keying (MSK) waveforms allows more efficient use of the spectrum and greatly reduces cross-channel interference. Receiving multiple baseband data channels, a derivation mechanism converts the data signals into series of impulses. These impulses may be split into odd and even channels, each at half the original data rate, and transmitted to a plurality of Walsh filters configured to have an impulse response corresponding to one of a plurality of orthogonal MSK waveforms. Odd and even channels, encoded with MSK waveforms, may combine into an in-phase and quadrature channel, 90° out of phase. A laser output may be divided, phase shifted, and modulated with the in-phase and quadrature channels, which divisions are then combined into a single multiplexed output. Walsh filters may decode the incoming signal in order to reproduce the original baseband channels.

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